



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 108 TO FACILITY OPERATING LICENSE NO. DPR-3

YANKEE ATOMIC ELECTRIC COMPANY

YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-029

INTRODUCTION

By application dated September 15, 1987 Yankee Atomic Electric Company (YAEC or the licensee) requested an amendment to the Facility Operating License (OL) for the Yankee Nuclear Power Station (YNPS). The proposed amendment would change the expiration date for the license from November 4, 1997 to July 9, 2000, an extension of two years and eight months.

The amendment request was supplemented on December 2, 1987, at the request of the staff, to provide information relevant to the provisions of the National Historic Preservation Act.

DISCUSSION AND EVALUATION

Section 103.c of the Atomic Energy Act (Act) of 1954 provides that a license is to be issued for a specified period not exceeding 40 years. 10 CFR 50.51 specifies that each license will be issued for a fixed period of time, to be specified in the license, not to exceed 40 years from date of issuance. 10 CFR 50.57 allows the issuance of an operating license pursuant to 10 CFR 50.56 for the full term specified in 10 CFR 50.51 in conformity with the construction permit (CP) and when other provisions specified in 10 CFR 50.57 are met. The current term of the license for the YNPS is 40 years commencing with the issuance of the CP. This represents an effective operating term of 37 years and 4 months, not 40 years. Consistent with the Act and our rules, as noted above, the licensee seeks an extension of the OL term for YNPS such that the fixed period of the license would be 40 years from the date of issuance of the OL.

Current NRC policy is to issue operating licenses for a 40 year term, commencing with the date of issuance of the OL. For YNPS this date was July 9, 1960. Thus a 40 year term would change the expiration date from November 4, 1997 to July 9, 2000 for an extension of two years and eight months, the interval between issuance of the CP and OL.

The licensee's request for extension of the operating license is based, in part, on the fact that a 40-year service life was considered during the design and construction of the plant. Although this does not mean that some components will not wear out during the plant lifetime, design features were incorporated which maximize the inspectability of structures, systems and equipment. Surveillance, inspectability and maintenance practices which were implemented in accordance with the ASME Code for Inservice Inspection and Inservice Testing of Pumps and Valves and the facility Technical Specifications provide assurance that any unexpected degradation in plant equipment will be identified and corrected. The specific provisions and requirements for ASME Code testing are set forth in 10 CFR Part 50.55a. The NRC, in its most recent

Systematic Assessment of Licensee Performance (SALP) Report, remarked that initiative was exercised to address plant aging and to increase oversight and effectiveness of quality programs. Throughout this decade the YNPS has attained SALP ratings among the highest for all operating plants in the United States.

We have completed our review of the YNPS reactor vessel in regard to fracture toughness requirements for protection against pressurized thermal shock events as required by 10 CFR 50.61. We found that the reactor vessel meets the fracture toughness requirements of 10 CFR 50.61 for 32 effective full power years of operation. As the reactor has an operating factor of 74% this would translate into at least 43 years of operation at this 74% factor. In addition, the rule provides a pressurized thermal shock screening criterion of 270°F maximum for the critical component in the YNPS reactor vessel; the actual value is 253°F as derived from the equation specified in the rule. This evaluation was provided in our letter to YAEC of March 10, 1987. We find that the reactor vessel for the YNPS meets the criteria of 10 CFR 50.61 for the requested license extension to a 40 year operating life.

Aging analyses have been performed by the licensee for all safety-related electrical equipment in accordance with 10 CFR 50.49, "Environmental qualification of electrical equipment important to safety for nuclear power plants, "identifying qualified lifetimes for this equipment. These lifetimes have been incorporated into plant equipment maintenance and replacement practices to ensure that all safety-related electrical equipment remains qualified and available to perform its safety function regardless of the overall age of the plant.

The staff's Safety Evaluation for environmental qualification of safety-related electrical equipment was issued by letter dated December 15, 1985. A subsequent audit of the program was conducted October 22-24, 1986 by the Office of Inspection and Enforcement, the results of which are documented in a December 5, 1986 Inspection Report. The staff has concluded and the inspection team verified that the licensee had implemented an environmental qualification program meeting the requirements of 10 CFR 50.49.

The Systematic Evaluation Program (SEP) was initiated at YNPS in February 1977 by the U.S. Nuclear Regulatory Commission to review the designs of older operating nuclear reactor plants to confirm and document their safety. The review provides (1) an assessment of how these plants compare with current licensing safety requirements relating to selected issues, (2) a basis for deciding on how these differences should be resolved in an integrated plant review, and (3) a documented evaluation of plant safety. The review was completed in July 1987. The review is documented in NUREG-0825, "Integrated Plant Safety Assessment" dated June 1983 and Supplement No. 1, dated October 1987. We concluded that the plant either meets current safety standards or will provide an equivalent level of safety once modifications resulting from seismic reevaluation are completed. The licensee's commitments in this area have been found acceptable by the staff.

A service life well in excess of 40 years is anticipated for the Yankee facility structures. Inspection of critical structures has identified no signs of deterioration in structural integrity. Considering the experience in other industries with similarly designed structures, the conservatism inherent in the design, construction, and operations of the facility, and the adequacy of the Yankee Preventive Maintenance Program to ensure refurbishment

and/or replacement as necessary to maintain the margins of safety identified in the Technical Specifications, an additional two years and eight months of operation will have no significant impact on plant safety.

The Staff has also reviewed the Final Safety Analysis Report (FSAR) for the plant. Many safety related changes have been made to the plant since it went on line in 1960. Major safety related changes are:

- An improved emergency core cooling system
- Addition of three emergency diesel generators
- Addition of two new emergency feedwater pumps
- Adding a safety parameter display system
- Adding an independent safe shutdown system
- Adding a solid-state reactor protection system and feedwater control system.

Each of these changes, where it involved a safety-related component, has been reviewed and approved by the staff; further, as required by 10 CFR 50.71(e), these changes and their effect on accident analysis, if any, are routinely updated in the FSAR. Our review of the FSAR for the facility has not identified any concerns associated with approval of the proposed amendment to extend the expiration date of the license that are not already addressed by licensee commitments, operating procedures, and license requirements.

The licensee provided a reference to the YNPS Probabilistic Safety Study in the September 15, 1987 submittal. However, the findings of this study were not applied to the licensee's safety analysis for the license extension. As the licensee has provided sufficient information for our review in regard to the safety analysis supporting the license extension and as the NRC has not completed its review of the Study, we agree that the Study results need not be considered in the license extension.

The Exclusion Area for the YNPS consists of property owned by YAEC or the New England Power Company except for a small parcel owned by the Deerfield Specialty Paper Company. The licensee has the authority to control activities within the Exclusion Area and anticipates no changes to the Exclusion Area boundary during the extended license period. Changes in population within the Low Population Zone (LPZ), nearest population center distances and 10 mile radius Emergency Planning Zone (EPZ) have been evaluated by the staff and have been found not to be significant for the period of the license extension. The details of the staff's review are contained in the associated Environmental Assessment dated June 2, 1988.

Accordingly, the Commission's conclusions regarding 10 CFR Part 100 siting criteria for the YNPS are that the exclusion area, LPZ, and population center distances meet the guidelines of 10 CFR Part 100 and are not changed by the proposed license extension.

Based on the above, it is concluded that extension of the operating license for the YNPS to allow a 40-year service life is consistent with the Integrated Plant Safety Assessment in that all issues associated with operational safety and population changes have already been addressed. Accordingly, we find the proposed extensions of the expiration dates of the Facility Operating Licenses for YNPS to be acceptable.

ENVIRONMENTAL CONSIDERATION

A Notice of Issuance of an Environmental Assessment and Finding of No Significant Impact relating to the proposed extension of the Facility Operating License expiration date for the Yankee Nuclear Power Station was published in the Federal Register on June 9, 1988 (53FR21743).

CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

ACKNOWLEDGEMENT

Principal Contributor: Morton B. Fairtile

Dated: June 9, 1988

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

15/
Richard H. Wessman, Director
Project Directorate I-3
Division of Reactor Projects I/II

Date of Issuance: June 9, 1988

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Yankee Nuclear Power Station

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